EPA Comments on Portland Harbor FS Key Elements Check-in (June 21 & 22, 2011)

July 15, 2011

1. Suitability of MNR. The RAL process selects the most highly contaminated areas for active remediation; other areas are slated for MNR. There has not been an analysis of whether MNR is a suitable candidate for these areas. Since burial will be the primary MNR mechanism, the Agency directs the LWG to evaluate and present in the draft FS additional lines of evidence (LoEs) to determine whether burial has occurred and is anticipated to continue in the future. Various lines of evidence may be conflicting, so a decision matrix or rules should be developed and presented in the draft FS to ascertain whether MNR will be a suitable remedy.

   The analysis of MNR is two-fold. First, areas where MNR will be relied upon for contaminant exposure reduction need to be identified. Second, metrics should be established for various empirical and modeling LoEs to indicate whether and the extent to which burial has occurred (or will occur). A process should then be established to combine these lines of evidence into an MNR suitability determination. For areas where concentration reductions are relied upon, but conditions are not conducive for MNR, alternate remedies should be evaluated.

2. MNR Areas. The Agency directs the LWG to present on maps the areas where MNR is expected to occur in order to meet the PRGs. EPA expects these areas to be those that exceed risk-based PRGs or background, whichever is greater and includes other lines of evidence to support MNR.

3. MNR Modeling. The Fate & Transport model is based on natural processes and does not account for anthropogenic processes (e.g., maintenance dredging, propeller wash, wave action, etc.). It is apparent in some areas of the site that anthropogenic processes may over-ride the natural burial processes predicted by the Fate and Transport model. Further, the Agency is concerned that the model seems to be predicting long-term natural recovery to level lower that upriver background. This need to be verified to be accurate in development of the draft FS and explained and supported in a clear and transparent manner since EPA may establish cleanup goals lower than upriver background based on this analysis as currently presented.

4. MNR Modeling. The Agency directs the LWG to conduct MNR modeling time=0 to begin pre-remedy implementation for all alternatives, not after completion of remedy implementation, since MNR should be occurring throughout the remedy implementation. Dredging residuals should not affect MNR as has been shown by dredging at BP/Arco, Terminal 4 and NW Natural.

5. MNR Modeling. When running the Fate and Transport model and presenting the results in the draft FS, the LWG must use the same number. For example, if the Total PCB upriver inputs to the Fate and Transport model are 5 ug/kg, then the concentration versus time curves for each remedial alternative needs to be evaluated to the time that it will take to meet 5 ug/kg. This is an important transparent application in that for Total PCBs the background exceeds the risks at the site and the expected long-term concentration needs to be evaluated. This is not to say that EPA will necessary select 5 ug/kg Total PCBs as the long-term cleanup level or that EPA will not select a remedy that does not meet 5 ug/kg in 30 years, but the information needs to be clearly presented in the draft FS. This comment also applies to all other contaminants where the background exceeds risk for risk drivers at the Site.

6. MNR Modeling. The Agency requests a working session with the LWG modeling team to more clearly understand sediment transport modeling output and to verify that deposition rates appropriately represented river conditions. In addition, the agency requests participation in the development of the evaluations of physical forces that could expose currently-buried contaminants above RALs for various scenarios.

7. PRG development. If PRGs are not presented in the revised draft RI, EPA expects that they will be developed at the 10^{-6} or HQ=1 risk levels, where applicable, and presented in the draft FS for all contaminants posing unacceptable risk.

8. Range of alternatives. The presented alternatives do not encompass the full suite of alternatives that should be evaluated. An alternative that will focus more on active remediation and less on MNR using the RAL process should be presented as Alternative G.

9. RALs. It appears that the RALs presented were developed on contaminants posing site-wide risk. However, there are also contaminants that are risk drivers in more localized areas of the site that may change the footprint of an SMA. RALs must be developed based on all risk driver contaminates; thus, concentration versus area curves must be developed for each risk scenario that has a contaminant risk greater than 10^{-4} or an HQ greater than 1. Further, SWACs must be appropriately conducted based on the risk scenario in which it represents. EPA expects these curves will be presented in the draft FS with a discussion regarding the process for selecting the final RALs and development of Sediment Management Areas (SMAs) and Sediment Management Units (SMUs) from those RALs.

10. RALs. Additional evaluations are needed to provide assurance that RAL-based remediation footprint also addresses non-RAL chemicals at risk-based levels. The LWG has not provided details about how which specific contaminants this would include or how this evaluation would be conducted and presented in the FS. EPA believes that additional RALs need to be developed and evaluated in the FS to provide this assurance. EPA noted at the check-in meeting, for example, that the revised draft BHHRA concludes that dioxins/furans pose the second greatest risk to humans from consumption of fish and shellfish. At a minimum, the LWG should develop RALs for dioxins/furans.

11. RALs. While EPA agrees with the RALs selected for Total PCBs and benzo(a)pyrene EQ in Alternatives B through E, Alternative F must have a Total PCB RAL of 100 ug/kg and a benzo(a)pyrene EQ RAL of 4000 ug/kg, and Alternative G must have a Total PCB RAL of 50 ug/kg and a benzo(a)pyrene EQ RAL of 400 ug/kg. Further Alternative F must have a 2,3,4,7,8-PCDF RAL of 20 ug/kg and Alternative G must have a 2,3,4,7,8-PCDF RAL of 1.5 ug/kg.

12. RALs. The Sum DDE RAL is not consistent with the early removal action for Arkema, which is using Sum DDx. EPA had directed the LWG to incorporate the early actions with the Harbor-wide FS. Thus, there must be RALs for DDx in the draft FS that includes values consistent with the Arkema early action in the range of values.

13. Benthic risk. While EPA agrees with the use of MQ for identifying areas of benthic risk based on predictions from sediment chemistry, the SMAs should also include areas of risk from level 2 and level 3 bioassay results.

14. Buried sediment contamination. The LWG based their SMAs on RAL exceedances in surface sediment concentrations. We understand the LWG is also using the hydro/sed model to predict areas of the river that could scour & expose buried sediment contamination that exceeds RALs. The LWG also needs to address areas of the site that are not prone to significant scour & do not show surface-sediment RAL exceedances, but contain elevated buried sediment contamination. Will these areas of buried sediment contamination be a significant source to surface sediment, TZW, surface water & biota? We understand that in the LWG's FS proposal, these areas (relatively clean surface sediment with buried elevated sediment contamination) will only be considered for MNR. The LWG needs to explain how these areas of buried sediment contamination will not pose an actionable threat to the river & aquatic receptors through erosion or subsurface contaminant transport mechanisms.

15. Sediment Management Areas (SMAs). SMAs must be based on iso-contours of RAL concentrations in surface sediment. If areas are closely located (e.g., small isolated spots graphically located nearby within the AOPC) then they should be merged into one SMA. The areas based Kriging of samples at depth that exceed RALs shall also be presented as an overlay and shaded as such to differentiate the subsurface footprint from the surface footprint. The FS should present a preference for dredging in areas exceeding RALs at depth since these are likely sources of surface contamination. Further, the LWG should not exclude any areas exceeding RALs in the Navigation Channel. These areas are also possible sources of contamination and must be evaluated appropriately.

16. Volume determinations. The approach presented does not comport with recent applications or technical literature on the topic. The 1-2 ft allowable overdredge, additional 1 ft residual dredge, 2:1 layback slopes, and 30-50% "engineering design factor" compound to create dredge volumes that are excessive, particularly for shallower dredge depths, compared to commonly used procedures for estimating FS-level dredge volumes. For example, the Lower Duwamish Waterway (LDW) FS volume estimate (AECOM 2010) was based on 19 representative sites and concluded that "additional volume allowance of 50% of the neat volume is reasonable for the LDW." The additional volume accounted for issues such as box cuts, residuals, dredge prism constructability, and dredge inaccuracy. Fuglevand and Webb (2009) recommends a 2:1 scaling factor (dredged volume: in-situ contaminated volume) for FS-level evaluations. That factor encompasses layback slopes, box cuts, residuals, and overdredge, and is based on experience with environmental dredging using mechanical dredges in Puget Sound. Therefore, the Agency directs LWG to use the neat volume estimate to be based on DOI. A +50% and +100% scaling factor should then be added to develop a range of estimated dredging volumes. A separate factor should not be included for over-dredge, engineering design, or residuals as these have already been accommodated in the scaling factors.

    AECOM. 2010. Appendix E. Methods for Calculating the Volume of Contaminated Sediments Potentially Requiring Remediation. Draft Final Feasibility Study, Lower Duwamish Waterway, Seattle, Washington.

    Fuglevand P, Webb R. 2009. Cost-Estimating Factors for Environmental Dredging. Abstract K-03, in: G.S. Durell and E.A. Foote (Conference Chairs), Remediation of Contaminated Sediments—2009. Fifth International Conference on Remediation of Contaminated Sediments (Jacksonville, Florida; February 2–5, 2009).

17. Subsurface contamination. The analysis does not seem to address the need for deeper dredging for full removal if subsurface material is a continuing source. Instead, as a decision rule LWG appears to only be considering exposure of subsurface sediments as a rationale for stopping dredging, and not dredging deeper to permanently remove the contaminants. The Agency directs the LWG to evaluate more extensive removal of principal threat material and hot spot material in subsurface sediments in the FS.

18. Material around active docks and piers. Despite previous requests for the analysis, LWG continues to use a decision rule that removal not be performed around or under docks or piers. If contaminated sediment is relatively high risk or a contaminant source, removal of contaminated sediments needs to be considered in the analysis. If dock replacement is required or there are financial impacts to operations, those costs can be included in the cost analysis. Hence, EPA directs the LWG include removal of pilings, docks, and other structures in areas where contamination exceeds the RALs.

19. Technology Screening. Issues remain with the technology screening based on site conditions. In particular, capping is not screened out at any location except navigation channels and future maintenance dredge areas. The "implementability" rules do not include, for example, steep slopes as a factor that would preclude capping. As such, they are not comprehensive of conditions that would limit the appropriate application of remedies. EPA directs the LWG to screen potential capping areas on the basis of whether they could accommodate a cap.

20. Contingencies (such as EMNR in MNR areas) should be established based on post-remediation monitoring data that are activated based on whether anticipated risk reduction was achieved.

21. Mitigation Costs. The LWG presented a range of cost estimates for within-study area mitigation work of $1 to $2 million per acre in 2010 dollars. The estimates for mitigation see rather high based on restoration cost estimates that have been developed for Natural Resource Defense. The Trustees have been developing cost estimates for restoration projects, and their estimate for restoration work within the study area ranges from approximately $500,000 to $800,000 per acre. The LWG should re-evaluate their on-site costs for restoration or mitigation work to capture the lower range of restoration and mitigation possibilities that exist on the site. The Trustees will provide information that is publicly available to help with this evaluation. Additionally, the LWG may work with the Trustees to ground-truth cost estimates. The values the LWG presented may be an appropriate high end value, but the Agency believes that there will be a range in mitigation costs. Consequently, the Agency directs the LWG to present a range in costs in the draft FS using $500K/acre as a low end.

22. Mitigation Costs. The Agency directs the LWG to include land acquisition costs in the draft FS.

23. Mitigation Costs. Mitigation costs all assume full mitigation vs. minimizing (e.g., filling of dredged volumes). This is counter to EPA's previous comments on mitigation tool. The Mitigation Guidance has a preference for minimizing actions over mitigation. This must be evaluated in the draft FS. EPA believes that both options could be evaluated for comparative purposes (cost of minimization versus cost of mitigation).

24. MNR Mitigation. The Services Biological Opinion may require mitigation for MNR areas if there is a continued exposure of ESA-listed species to contaminants going forward due to EPA's decision.

25. Cost Calculations. There are a lot of pilings located throughout the lower Willamette River that will likely need to be removed in order to implement remedy. The Agency directs the LWG to evaluate to the cost of piling removal in the draft FS.

26. Mitigation Selection. It should be noted that it is very unlikely that NMFS would approve mitigation outside the Harbor since that is where the harm will be occurring. Further, NMFS will assess mitigation needs based on the values they developed, not on the LWG's "functional habitat values."

27. Hot spots of contamination. One of the 2 threshold criteria in the remedy selection is meeting or exceeding ARARs. DEQ's Cleanup Rules have been at least preliminarily identified as ARARs, & specifically hot spot rules (ORS 465.200 et. Seq. & specifically OAR 340-122-0090 (4) and -0085). EPA directs the LWG to address hot spots in context of state rules as ARARs in the draft FS. A follow-up meeting between DEQ, EPA & the LWG to discuss a practical way for the FS to address hot spots & other state ARARs should be scheduled in the near future.

28. Protectiveness. Management of waste in the river will be difficult at best. The LWG is heavily relying on MNR through burial as a means of managing a majority of the contamination at the site. EPA is concerned about management of these areas in the future due to the extent of activities that occur at this site. While the Army Corp of Engineers has been cooperative in coordinating with the Agency regarding dredging activities in the site, other private dredging operations and structural repairs have not been well coordinated with the Agency. If the LWG is going to propose remedial alternatives that manage waste in place, those alternatives need to include effective ways to ensure that the buried contamination is not exposed due to human activity at the site in the future.

    The MNR analysis is central to all of the alternatives. The analysis shows that contaminated sediment will be buried by clean(er) sediment such that PRGs will be achieved everywhere in Portland Harbor eventually. It is not clear that this phenomenon is happening everywhere or as quickly as indicated by the model. It also seems unlikely that the certainty in the predictions will increase before the Record of Decision is issued. A long-term monitoring plan needs to be developed by EPA and stakeholders using the DQO process and implemented in such a way that will allow evaluation of MNR over time to check the validity of the model. This should include baseline monitoring that would ideally occur prior to EPA's development of the Proposed Plan, monitoring throughout remedy implementation, and post remedy to establish effectiveness.

29. The Agency expects that the output graphics for the MNR analysis in the draft FS will also illustrate uncertainty in the predicted outcome.

30. The Agency expects that the analysis in the FS will be consistent with the analysis and rules presented in the Baseline Risk Assessment. EPA has already advised the LWG in our comments on the FS Tools presentation in December 2010 of our concerns with the LWG's evaluation of

the affects of using zero or other values rather than ½ the detection limit in the draft FS. EPA would not accept modifications based on such analysis in the FS.

31. EPA requests that the LWG provide the Agency the following information.

    a. Data – Volume estimate spreadsheets from presentation
    b. GIS – AOPC, SMA and sub SMA (with DV types) polygons as currently proposed by LWG
    c. GIS- Theiseen and sub-Theissen polygons used in volume/cost assessments
    d. GIS-Bathymetry – all interpolated and raw data collected
    e. GIS-Surface sediment model grid mesh as GIS layer
    f. GIS-Navigation channel with permitted depths
    g. Sediment surface shear force and/or velocities at worst case (peak, peak day, peak month, peak year) and modeled average conditions